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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,010	05/31/2005	Peter George Robin Smith	DY0UP0288US	8594
23908	7590	10/06/2006	EXAMINER	
RENNER OTTO BOISSELLE & SKLAR, LLP			RAHLL, JERRY T	
1621 EUCLID AVENUE			ART UNIT	PAPER NUMBER
NINETEENTH FLOOR				2874
CLEVELAND, OH 44115				

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/535,010	SMITH ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jerry T. Rahill	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 13 May 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-21 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-21 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 13 May 2005 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
     Paper No(s)/Mail Date 5/13/05.

4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

2. The information disclosure statement (IDS) submitted on May 13, 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### *Drawings*

3. The drawings submitted have been reviewed and determined to facilitate understanding of the invention. The drawings are accepted as submitted.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. **Claims 1-4, 9-10, and 12-14 are rejected under 35 U.S.C. 102(a) as being anticipated by “Fabrication of directly UV-written channel waveguides with simultaneously defined integral Bragg gratings.” Electronics Letters. Vol. 38, No. 24 to Emmerson et al.**

6. Regarding Claim 1, Emmerson et al. describes a method of writing a waveguide channel of increased refractive index into a sample comprising providing a sample of material of material having a region which is photosensitive to light of a specific wavelength (“planar sample”, see

*Introduction*), generating a spot of light at the specific wavelength, where the spot has a periodic intensity pattern of high and low intensity fringes and a width related to the width of the channel (see description of Figure 1 under *Experiment*), positioning the spot within the photosensitive region (see Figure 1), and causing a relative movement between the ample and the light spot along the path of the channel to define the channel (see third paragraph under *Experiment*).

7. Regarding Claim 2, Emmerson et al. describes the relative movement at a constant velocity with continuous exposure to the light spot to produce a uniform change in the refractive index (see third paragraph under *Experiment*).
8. Regarding Claim 3, Emmerson et al. describes exposure to the light spot as discontinuous during the relative movement to produce a Bragg grating (see third paragraph under *Experiment*).
9. Regarding Claim 4, Emmerson et al. describes the discontinuous exposure comprising a plurality of adjacent exposures long the path of the channel (see *Results*).
10. Regarding Claim 9, Emmerson et al. describes the light spot as circular (see Figure 1).
11. Regarding Claim 10, Emmerson et al. describes the light spot generated by intersecting two beams of light at an angel (see second paragraph under *Experiment*).
12. Regarding Claim 12, Emmerson et al. does not specifically describe the low intensity fringes of the light spot having intensity greater than zero. However, actual interference patterns inherently have some low level of intensity, even in “zero intensity” regions of the pattern.
13. Regarding Claim 13, Emmerson et al. describes controlling polarization of the light to modify the change in refractive index (see third paragraph under *Results*).
14. Regarding Claim 14, Emmerson et al. describes the channel as substantially linear (see Figure 1).

*Claim Rejections - 35 USC § 103*

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. **Claims 11 and 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emmerson et al.**

18. Regarding Claim 11, Emmerson et al. does not specifically describe the light spot generated by exposure through a phase mask. However, phase masks are well known in the art to production of interference patterns (see US Patents 5,818,988 and 6,549,705 by way of example). At the time of invention, it would have been obvious to one of ordinary skill in the art to use a phase mask in the device of Emmerson et al. to create an interference pattern. The motivation would have been to reduce the precision necessary from the focusing optics.

19. Regarding Claim 15, Emmerson et al. does not specifically describe the channel having a curve. However, curved channel planar waveguides are well-known in the art. At the time of

invention, it would have been obvious to one of ordinary skill in the art to form the channel of Emmerson et al. with a curve. The motivation for doing so would have been to allow for the channel to connect optical elements with inputs/outputs not in direct line with each other.

20. Regarding Claim 16, Emmerson et al. does not specifically describe the channel having two or more interconnecting portions. However, channel planar waveguides with interconnecting portions are well-known in the art. At the time of invention, it would have been obvious to one of ordinary skill in the art to form the channel of Emmerson et al. with interconnecting portions. The motivation for doing so would have been to form an integral coupler.

21. Regarding Claim 17, Emmerson et al. does not specifically describe repeating the positioning of the spot and causing relative movement so as to define additional channels with substantially the same path as the said channel. However, reproduction of identical planar waveguide elements on a single substrate is well-known in the art. At the time of invention, it would have been obvious to one of ordinary skill in the art to form plural waveguide elements identical to the above-described channel. The motivation for doing so would have been to allow for easier manufacturing using a larger substrate.

22. Regarding Claims 18-20, Emmerson et al. does not specifically describe the photosensitive region including hydrogen or deuterium. However the addition of hydrogen or deuterium via loading or thermal locking to increase photosensitivity of an optical material is well-known in the art. At the time of invention, it would have been obvious to one of ordinary skill in the art to load or thermal lock hydrogen or deuterium to the photosensitive material of

Emmerson et al. The motivation would have been to reduce the required power of incident light to affect the refractive index of the photosensitive material.

23. **Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emmerson et al. in view of US Patent No. 5,066,133 to Brienza.**

24. Regarding Claim 5, Emmerson et al. does not describe adjacent exposures overlapping. Brienza describes a method of forming gratings on a sample material using interference of light, where adjacent grating regions are formed to overlap each other (see Column 9 Lines 1-18). At the time of the invention, it would have been obvious to use the overlapping grating setup of Brienza in the method of Emmerson et al. The motivation to do so would have been to reduce the necessary length of the total grating structure.

25. Regarding Claim 6, the overlapping exposures of the combined Emmerson et al. and Brienza would inherently result in the periodic increase in the refractive index having a different period from that of the light spot due to interactions of the multiple gratings.

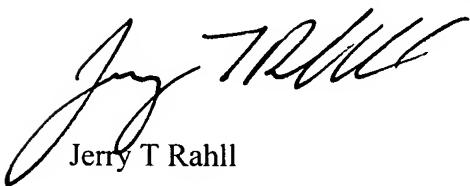
26. Regarding Claim 7, the overlapping exposures of the combined Emmerson et al. would inherently result in a chirped Bragg grating due to the variable periodic from the overlapped gratings. Further, the Brag gratings created inherently contain arbitrary phase shifts as a result of Bragg's rule.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry T. Rahll whose telephone number is (571) 272-2356. The examiner can normally be reached on M-Th (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jerry T Rahll



SUNG PAK  
PRIMARY EXAMINER